

CLAIMS

What is claimed is:

1. A probe card for testing an integrated circuit, the probe card comprising:

a head plate having an opening;

a beam assembly mounted to the head plate and disposed across the opening of the head plate; and

a plurality of probe needles extending through the beam assembly, wherein each probe needle has a first end extending through the beam assembly and a second end for contacting the integrated circuit.

2. The probe card of claim 1, wherein:

the beam assembly comprises:

a support beam mounted to the head plate; and

a probe guide mounted to the support beam; and

the first end of each probe needle extends through the probe guide.

3. The probe card of claim 2, wherein the support beam comprises a steel beam.

4. The probe card of claim 2, wherein the probe guide has a plurality of pre-drilled through-holes for receiving the first end of each probe needle.

5. The probe card of claim 1, wherein the probe needles comprise cantilever probe needles.

6. The probe card of claim 1, wherein the beam assembly has a probe needle pitch of less than approximately 100 microns.

7. The probe card of claim 1 further comprising a plurality of beam assemblies mounted to the head plate and disposed across the opening of the head plate, wherein each of the plurality of beam assemblies are substantially parallel.

8. The probe card of claim 7, wherein the plurality of probe needles are disposed in a high density array and wherein each probe needle comprises a cantilever mounted pin.

9. The probe card of claim 8, wherein each beam assembly has approximately 800 – 2500 probe needles.

10. A probe card assembly for providing temporary electrical connections to an integrated circuit, the probe card assembly comprising:

a sub-structure; and

a probe card comprising:

a head plate mounted to the sub-structure, wherein the head plate has an opening;

a beam assembly mounted to the head plate and disposed across the opening of the head plate; and

a plurality of probe needles extending through the beam assembly.

11. The probe card assembly of claim 10, wherein:

the beam assembly comprises:

a support beam mounted to the head plate; and

a probe guide mounted to the support beam; and

each of the probe needles extend through the probe guide.

12. The probe card assembly of claim 10, wherein the sub-structure is a printed circuit board .

13. The probe card assembly of claim 12, wherein each probe needle has a first end and a second end, wherein the first end extends through the beam assembly for contacting the printed circuit board and the second end contacts the integrated circuit.

14. The probe card assembly of claim 13, wherein the second end forms a solderless contact with the integrated circuit.

15. A system for simultaneous testing of a plurality of devices, the system comprising:

a probe card assembly comprising:

a sub-structure;

a head plate mounted to the sub-structure, wherein the head plate has an opening;

a plurality of beam assemblies mounted to the head plate and disposed across the opening of the head plate, each beam assembly comprising:

a support beam; and

a probe guide mounted to the support beam; and

a plurality of cantilever probe needles extending through the probe guide;

an automatic test equipment for receiving and analyzing electrical signals from the probe card assembly; and

an interface assembly for connecting the automatic test equipment to the probe card assembly.

16. A method of manufacturing a probe card comprising the steps of:

(a) providing a head plate having an opening;

(b) providing a probe needle having a first end and a second end;

(c) inserting the probe needle through a beam assembly, such that the first end of the probe needle extends through the beam assembly; and

(d) mounting the beam assembly on the head plate such that the beam assembly is disposed across the opening of the head plate.

17. The method of claim 16, wherein the step of inserting comprises inserting the probe needle through a probe guide, such that the first end of the probe needle extends through the probe guide; and further comprising the step of mounting the probe guide to a support beam, such that the beam assembly is formed.

18. The method of claim 17, further comprising the step of drilling a through-hole into the probe guide, wherein the through-hole is for receiving the first end of the probe needle.

19. The method of claim 16, wherein the probe needle comprises a cantilever probe needle.

20. The method of claim 16, further comprising repeating the mounting step for a plurality of beam assemblies, wherein the beam assemblies are configured substantially parallel to each other.